

CLAIMS

1. Process for the production of a molecule vector that can be used in water treatment, able to trap heavy ions, characterized in that it comprises the following stages:

- Diluting ornithine, $\text{NH}_2\text{-(CH}_2\text{)}_3\text{-CH(NH}_2\text{)-COOH}$, in water,
- Adjusting the pH to a value of between 6.5 and 7.5,
- Adding glutaraldehyde, $\text{OHC-(CH}_2\text{)}_3\text{-COH}$, and
- Awaiting the polycondensation reaction and the formation of imines, and
- Recovering the poly(ornithine-G) that is obtained.

2. Process for the production of a molecule vector that can be used in water treatment according to claim 1, wherein the ornithine that is used is the L-ornithine form that leads to the formation of poly(L-ornithine-G).

3. Process for the production of a molecule vector that can be used in water treatment according to claim 1 or 2, wherein the linear polymer that is obtained is grafted on a solid substrate.

4. Process for the production of a molecule vector that can be used in water treatment according to claim 3, wherein the linear polymer that is obtained is grafted on activated polystyrene balls or chlorosulfonated polystyrene balls.

5. Process for the production of a molecule vector that can be used in water treatment according to claim 1 or 2, wherein a cross-linking agent is added to obtain a 3D poly(L-ornithine-G) network.

6. Process for the production of a molecule vector that can be used in water treatment according to claim 5, wherein the cross-linking agent is polyethylenimine.

7. Process for the production of a molecule vector that can be used in water treatment according to claim 5 or 6, wherein the homopolymer that is obtained is dispersed into a hydrophobic organic medium to obtain a two-phase effect or to produce poly(L-ornithine-G) beads.

8. Process for the production of a molecule vector that can be used in water treatment according to claim 7, wherein to collect the thus formed beads, they are mechanically held on a filter and then dried under a stream of hot air.

9. Process for the production of a molecule vector that can be used in water treatment according to claim 7 or 8, wherein heating of the hydrophobic organic medium that is used is initiated.

10. Process for the production of a molecule vector that can be used in water treatment according to any of the preceding claims, wherein to reduce the double bonds of the imines and to obtain amines, the following operations are initiated:

- Degreasing of the polymer that is obtained resulting from the condensation reaction,
- Treatment at least once with soda, and
- Bringing this polymer into the presence of sodium borohydride.

11. Molecule vector that can be used in water treatment, wherein it comprises the poly(ornithine-G) that is obtained by the process according to any of the preceding claims, in substrate-grafted linear form or in cross-linked form in a three-dimensional network.

12. Use of the vector of claim 11, obtained according to the process of any of claims 1 to 10, wherein it is used for the recovery of heavy metal ions in liquids that have a pH of between 6.5 and 7.5, more particularly 7.0.